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10/648,579	08/25/2003	Toshiyuki Takabayashi	03500/HG	4092

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EXAMINER

BERMAN, SUSAN W

ART UNIT

PAPER NUMBER

1711

DATE MAILED: 04/17/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/648,579

**Applicant(s)**

TAKABAYASHI, TOSHIYUKI

**Examiner**

Susan W. Berman

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 16 February 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 8-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 and 12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 25 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

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***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 02-16-2006 has been entered.

***Terminal Disclaimer***

The terminal disclaimer filed on 01-05-2005 disclaiming the terminal portion of any patent granted on this application which would extend beyond the expiration date of Application No 10/647,170 has been reviewed and is accepted. The terminal disclaimer has been recorded.

***Response to Arguments***

Applicant's arguments filed 02/16/2006 have been fully considered but they are not persuasive for the following reasons. Applicant argues that the distinguishing feature of the instantly claimed compositions is the maximum bond distance of 0.1688-0.1750 between S-C in the photoacid generators set forth. It is noted that the claims set forth "maximum bond distance", which is defined in the specification as the maximum value of the bond distance wherein "bond distance" is defined as the value calculated based on the molecular orbital calculation method employing "WinMOPAC". See paragraph [0040]. Therefore, the claim recitation "maximum bond distance ...0.1688-0.1740 nm" is considered to include all bond distances less than and up to a maximum of 0.1688-0.1740 nm. However, this is indefinite because it is not clear which number represents the maximum.

The evidence for unexpected results presented in the Declaration under 37 CFR 1.132 filed 06/09/2005 and the Supplemental Declaration under 37 CFR 1.132 filed 12/14/2005 has been

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reconsidered. The evidence in view of the scope of the instant claims has been reconsidered. Upon reconsideration, the data presented in the Declarations filed 06/09/2005 and 12/14/2005 is unpersuasive of unexpected results for the following reasons.

The sulfonium salts disclosed by Ohkawa et al are species corresponding to applicant's Formula (II) in instant claim 1. The sulfonium salts tested in the Declaration filed 06/05 as being representative of the instant invention are salts of Formula (I) in instant claim 1. Applicant compared Examples 3 and 4 disclosed by Ohkawa et al with Examples comprising Compound 7 or Compound 5 in Ink Set 2 of the instant invention. Compounds 5 and 7 are species of Formula (I) in instant claim 1. Thus the comparative data presented fails to compare Examples disclosed by Ohkawa et al to Examples from the instant claims which are the closest to the prior art disclosure. Ohkawa et al disclose sulfonium salts in the Synthesis Examples that are species of Formula (II) set forth in instant claim 1, not of Formula (I) in instant claim 1. In addition, the data is not commensurate in scope with the instant claims because the photopolymerizable compositions employed to show unexpected results comprise a colorant, an oxetane compound, an epoxy compound, an acid increasing agent, a thermal base generator in addition to the photoacid generator. There is no evidence of record to show unexpected results for compositions comprising only a "photopolymerizable monomer" or comprising photopolymerizable monomers other than epoxy and oxetane monomer mixtures.

***Claim Rejections - 35 USC § 112***

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-7 and 12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. In the claim 1 paragraph setting forth "maximum bond distance", applicant recites bond

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distances between adjacent C and each of  $S_1$ ,  $S_3$ ,  $S_4$ , and  $S_5$  and then sets forth “are 0.1688-0.1750 nm, respectively”. It is not clear from the term “respectively”, which bonds and which distances go together. If applicant intends to set forth that the bond distance from  $S_1$  to the adjacent carbon atom in formula I should be at least 0.1686 nm and no more than 0.1750 nm, as set forth in paragraph [0041], it should be so stated. The claims should also clearly set forth which bond distance is intended to be so limited. See the Table in paragraph [0045] for formula II and the table in paragraph [0047] for formula III.

***Claim Rejections - 35 USC § 102/35 USC § 103***

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1-3, 7 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Ohkawa et al (6,368,769). Ohkawa et al disclose compositions comprising an aromatic sulfonium salt of formula 1 defined in column 4, lines 1-18, wherein  $R^1$  is phenylene, thus providing a sulfonium salt having at least one substituent other than H on a phenyl group. Sulfonium salts corresponding to formula II and to formula III in the instant claims are taught. See synthesis examples 1-6. Polymerizable epoxy and oxetane and vinyl ether compounds are taught in column 8, lines 15-24. Pigment is taught in column 11, line 29. Applicant's claims include the bond lengths between 0.1686-0.1750 of the compounds disclosed by Ohkawa et al.

Claims 1-5, 7 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkawa et al (6,368,769). Ohkawa et al disclose compositions comprising an aromatic sulfonium salt of formula 1 defined in column 4, lines 1-18, wherein  $R^1$  is phenylene, thus providing a sulfonium salt having at least one substituent other than H on a phenyl group. Sulfonium salts corresponding to formula II and to

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formula III in the instant claims are taught. See synthesis examples 1-6. Polymerizable epoxy and oxetane and vinyl ether compounds are taught in column 8, lines 15-24. Pigment is taught in column 11, line 29.

Ohkawa et al do not teach requiring a bond distances between S and C corresponding to the bond distance between S<sub>1</sub> and the adjacent C atom in the instantly claimed formulae.

Ohkawa et al teach mono-oxetane compounds and bis-oxetane compounds and that the compounds can be used independently or in combination (column 9, line 38, to column 10, line 28. Oxetane compounds are said to effect flexible properties for the moldings disclosed. Ohkawa et al also teach compositions comprising an oxetane compound in an amount of 30% or more and epoxy resin in an amount of 70% or less (column 11, lines 3-10). Ohkawa et al do not specifically teach compositions comprising a mono-oxetane compounds and bis-oxetane compound or compositions comprising an oxetane compound and an epoxy compound in the weight percents recited in claim 5.

It would have been obvious to one skilled in the art at the time of the invention to select sulfonium compounds from those taught by Ohkawa et al inherently having the bond distance between S and adjacent carbon set forth in the instant claims. With respect to claim 4, It would have been obvious to one skilled in the art at the time of the invention to provide a composition comprising 60-95 weight percent oxetane compound and 5-40 weight percent epoxy compound from the teaching of Ohkawa et al to use more than 30% oxetane compound in combination with an epoxy compound. With respect to claim 5, It would have been obvious to one skilled in the art at the time of the invention employ a combination of oxetane compounds having one oxetane ring and having two or more oxetane rings, as suggested by Ohkawa et al. One of ordinary skill in the art at the time of the invention would have been motivated by a reasonable expectation of successfully providing a composition for stereolithography taking advantage of the flexibility properties of the oxetanes and the fast curing properties of the epoxies taught by Ohkawa et al.

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Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ohkawa et al (6,368,769), as applied to claims 1-5, 7 and 12 above, and further in view of Mantell et al (5,641,346). Ohkawa et al do not teach the low viscosities set forth in claim 6. However, Mantell et al teach compositions for ink jet printing having suitable viscosities within the instantly claimed range. The compositions comprise vinyl ether and epoxy compounds and a cationic photoinitiator.

It would have been obvious to one skilled in the art at the time of the invention to adjust the viscosity of the compositions taught by Ohkawa et al to a viscosity suitable for ink jet printing, as taught by Mantell et al in an analogous composition. One of ordinary skill in the art at the time of the invention would have been motivated by a reasonable expectation of providing a useful composition for ink jet printing, as taught by Mantell et al. It is considered to be within the ordinary skill in the art to adjust the viscosity of a known composition for a particular application, such as ink jet printing.

### ***Conclusion***

Ushirogouchi et al (6,959,986) is cited as art of interest.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Susan W. Berman whose telephone number is 571 272 1067. The examiner can normally be reached on M-F 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on 571 272 1078. The fax phone number for the organization where this application or proceeding is assigned is 571 273 8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SB  
4/13/06



Susan W Berman  
Primary Examiner  
Art Unit 1711